FIRST QUANTUM MINERALS LTD.

NOTICE OF COMMISSIONING

1824-A-NOC-108

MINERA PANAMA
COMMISSIONING IN PROGRESS
PUESTA EN MARCHA EN PROGRESO
The purpose of this TAG is to IDENTIFY EQUIPMENT which is still in the commissioning phase.
El propósito de esta ETIQUETA es para IDENTIFICAR el EQUIPO que está bajo la etapa puesto en marcha.
This equipment must not be operated without the Permission of the Commissioning Manager or Authorised Nominee.
No operar este equipo sin el Permiso del Director de Comisión o del Designado Encargado.
This Tag can only be removed by the Commissioning Manager or Authorised Nominee.
Solo el Director de Comisión o Designado Encargado puede quitar esta Etiqueta.
SEE OTHER SIDE / VER EL REVERSO

Date: April 26, 2018 – 07:00 am

System ID: 2-526

System Description: Unit 2 – Nitrogen Storage and Transfer.

Contact Name: Julian Blair, Brenton Sherston & Milton Cabanillas, Norman Tarran & Ron Freiley , Charles Lee

Contact Number: 63799990, 64422720 & 69804755, 66197102 & 69804558, 6482 2269

Fecha: 26 de Abril del 2018 - 07:00 am

ID Sistema: 2-526

Descripción del Sistema: Sistema de almacenamiento y transferencia de Nitrógeno de la unidad 2

Nombre Contacto: Julian Blair, Brenton Sherston & Milton Cabanillas, Norman Tarran & Ron Freiley , Charles Lee

Número de Contacto: 63799990, 64422720 & 69804755, 66197102 & 69804558, 6482 2269

ENGLISH

All Electrical & Mechanical equipment's for Unit 2 Nitrogen Storage and Transfer are under Commissioning. Access restrictions will be in force. Upon completion the commissioning test, power feed will be reticulated to the equipment's. All equipment access will be locked with appropriate signage. No work is to be conducted on equipment tagged with a Blue Commissioning Tag without approval from the Commissioning Manager. Please see drawings attached.

Commissioning team will begin works in this area on April 26, 2018 at 07:00 AM

SPANISH

Todos los equipos eléctricos y mecánicos del sistema de almacenamiento y transferencia de Nitrógeno de unidad 2 están bajo puesta en marcha. Las restricciones de acceso estarán en vigor para esta área.. Una vez completada las pruebas de puesta en marcha, se pondrá alimentación eléctrica a los Equipos. Todos los accesos a estos equipos se bloquearán con señalización apropiada. No se realizará ningún trabajo en equipos con etiqueta de puesta en marcha color azul y sin la aprobación del Gerente de Puesta en Marcha. Por favor ver planos adjuntados.

El equipo de puesta en marcha iniciará trabajos en esta area el 26 de Abril del 2018 a las 07:00 AM.

POST ON ALL PACO SAFETY NOTICE BOARDS

PACO MANAGERS & SUPERINTENDENTS TO **ENSURE** THIS **NOC** IS COVERED IN TOOLBOX MEETINGS AND ALL PERSONNEL ARE AWARE OF THE HAZARDS.

MATCH LINE AT N:6791.400.SEE DRAWING E2-0604 FOR CONTINUATION

MATCH LINE AT N:6791.400.SEE DRAWING E2-0604 FOR CONTINUATION

NORTH

MATCH LINE AT E:3854.802

MATCH LINE AT E:3898.829

MATCH LINE AT E:3854.802

MATCH LINE AT E:3898.829

2AS524
MAIN STOP MOV
FOR SOOT BLOWER
EL.(+)59.078M

2PIT-AS501
SB STM SPLY
PRS

2TE-AS500B
AUX STEAM
HEADER TMP-B

2TE-AS500A
AUX STEAM
HEADER TMP-A

2PIT-AS500A
AUX STEAM
HEADER PRS-A

2PIT-AS500B
AUX STEAM
HEADER PRS-B

2TE-HR501C
RHR OUT STM
TMP-C

2TE-HR501B
RHR OUT STM
TMP-B

2TE-HR501A
RHR OUT STM
TMP-A

2PIT-HR500
RHR OUT
STM PRS

2BD545
HRH STEAM VENT
STOP MOV AT EL.(+)59.32M

2BT560J
RHR METAL TEMP JB

2PIT-MS500B
MS PRS-B

2PIT-MS500A
MS PRS-A

2PIT-HP502
FSH INLT STM PRS

2BT550J
FSH METAL TEMP JB

2BT540J
2ND PLTN SHR METAL TEMP JB

2FW504
PSH STM TCV
AT EL.(+)59.7M

2HP528
AUX STM PCV FROM
2ND PLTN SHR
EL.(+)59.95M

2MS503
MAIN STEAM STARTUP
VENT STOP MOV
AT EL.(+)60.02M

2MS501
ELECTRICAL RELIEF VALVE
FOR SH OUTLET
AT EL.(+)60.92M

2MS501J
ERV CONTROL PANEL

2FIT-AS501
20K AUX STM FLO

2FW503
SPRAY WATER FOR SH1
C/V INLET STOP MOV
AT EL.(+)58.92M

2HP527
2ND PLATEN SH STEAM FOR AUX
STEAM C/V INLETSTOP MOV
EL.(+)59.25M

2FW525
20K AUX STM TCV
WITH ATTEMP
EL.(+)60.24M

2LIT-HP500C
STM DRM LVL-C

2PIT-HP501B
STM DRM PRS-B

2TE-HP500A
STM DRM
MET TMP-A

2PIT-HP501A
STM DRM PRS-A

2TE-HP500B
STM DRM MET
TMP-B

2BD531
SATURATED STEAM
VENT STOP MOV
EL.(+)61.98M

2FW524
SPRAY WATER FOR
AUX. STEAM C/V
INLET STOP MOV
EL.(+)59.02M

2HC507G
ELEVATOR LOCAL
CONTROL PANEL

2EW013E
U2 BOILER AREA
WELDING RECEPTACLE-6

2FW510
SPRAY WATER FOR FINAL
SH C/V INLET STOP MOV
EL.(+)59.07M

2FW511
2ND PLTN SHR STM TCV-A
EL.(+)59.80M

2FW513
2ND PLTN SHR STM 2ND TCV-B
EL.(+)59.78M

2LIHP500JA
EWL LOCAL
ELECTRONIC UNIT

2TE-HP500C
STM DRM MET TMP-C

2TE-HP500D
STM DRM MET TMP-D

2LIT-HP500B
STM DRM LVL-B

2LIT-HP500A
STM DRM LVL-A

2TE-CH504B
#D COAL SI TMP-B

2LS-CH504
#D COAL SI
LVL SW

2TE-CH504A
#D COAL
SI TMP-A

2TE-CH503B
#C COAL SI TMP-B

2LS-CH503
#C COAL SI
LVL SW

2TE-CH503A
#C COAL
SI TMP-A

2TE-CH502B
#B COAL SI TMP-B

2LS-CH502
#B COAL SI
LVL SW

2TE-CH502A
#B COAL
SI TMP-A

2TE-CH501B
#A COAL SI TMP-B

2LS-CH501
#A COAL SI
LVL SW

2TE-CH501A
#A COAL
SI TMP-A

MATCH LINE AT N:6727.900.SEE DRAWING E2-0602 FOR CONTINUATION

400		33600						400			
2500	5900		8400		8400		5900		2500		
B19	B18	B17	B16	B15		B14	B13	B12	B11		

PLAN AT ELEVATION EL.(+)56.900M

2500	5900	400		33600				400	5900	2500	
			8400		8400						
B19	B18	B17	B16	B15		B14	B13	B12	B11		

PLAN AT ELEVATION EL.(+)51.000M

BH	
	10000
BG	
	6300
BF	
	9000
BE	
	4700
BD	
	12100
BC	
	4500
BB	
	10000
BA	

2SB519C
SOOTBLOWER
EL.(+)51.950M

2SB518C
SOOTBLOWER

2BA530J
FEGT AIR PANEL

2SB516C
SOOTBLOWER

2SB517C
SOOTBLOWER

2SB515C
SOOTBLOWER

2SB514C
SOOTBLOWER

2SB513C
SOOTBLOWER

2PIT-BA525C
FURN PRS-C

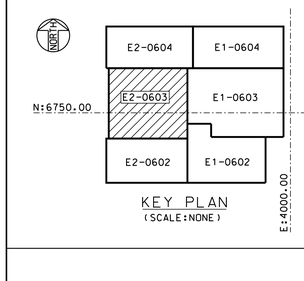
2PIT-BA525B
FURN PRS-B

2PIT-BA525A
FURN PRS-A

2PDIT-BA525
FURN DP-A

2PDIT-BA526
FURN DP-B

ELEVATOR



KEY PLAN
(SCALE:NONE)

VENDOR DRAWING

1) 11217D-ME-DW -ME220-P6001-00066	INSTRUMENTATION AND CONTROL LOCATION DRAWINGS

NOTES

1) FOR NOTES,REFERENCE DRAWINGS & LEGENDS SEE SHEET-001 OF THIS DRAWING.

0 1 2 3 4 5 10
SCALE 1:100
GRAPHIC SCALE IN METERS

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE. INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

Contractors: SK E&C USA
Engineers: Sargent & Lundy
Client: Minera Panamá

PROJECT NO.: 12889-001

Project Title:
PACO POWER PLANT

DRAWING TITLE

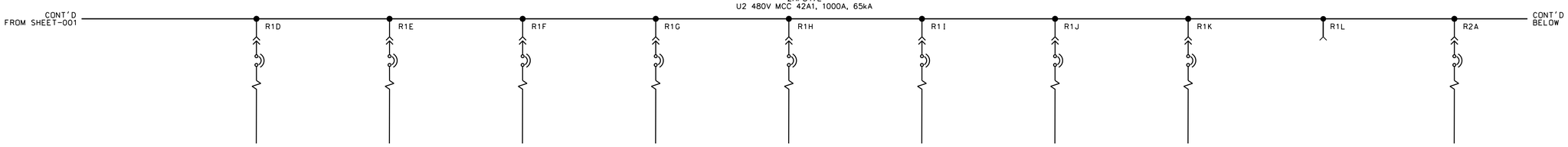
ELECTRICAL INSTALLATION
BOILER AREA UNIT#1
AT EL.(+)51.000M AND
AT EL.(+)56.900M

DRAWING NUMBER	REVISION
E2-0603	1
SHEET 004 OF 004	

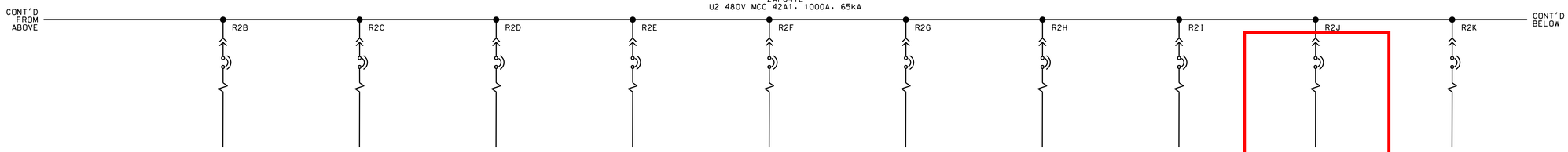
DRAWING RELEASE RECORD

REV.	DATE REL'D.	PREPARED	REVIEWED	APPROVED	PURPOSE
0	29SEP2015	R.JOSHI	A.PATEL/R.BEEDIE	Y.MISHRA/K.NOMANBHOY	ISSUED FOR CONSTRUCTION
1	12JUL2017	K.SHAH	R.DESAI/R.BEEDIE	Y.MISHRA/K.NOMANBHOY	ISSUED FOR CONSTRUCTION

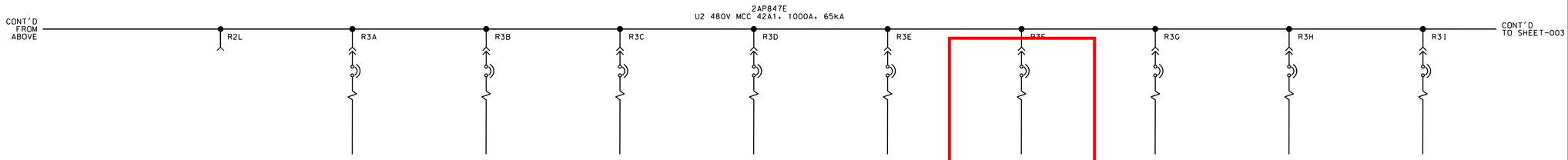
CAD FILE: E2-0603-004.DGN



	2-818	2-818	2-818	2-818	2-818	2-818	2-818-A	2-818-B		2-810-1
SCHEMATIC E2-1200 SH.	2BA026	2BA027	2BA028	2BA029	2BA030	2BA031	2BY027	2BY028	-	2BA007
KW, KVA OR MOTOR HP	0.45 KW	0.45 KW	0.45 KW	0.45 KW	0.45 KW	0.45 KW	4.5 KVA	4.5 KVA	-	0.4 KW
STARTER NEMA SIZE	-	-	-	-	-	-	-	-	-	-
BREAKER/MCP RATING (AMPS)	16A	16A	16A	16A	16A	16A	40A	40A	-	16A
OL RATING (AMPS)	-	-	-	-	-	-	-	-	-	-
SERVICE	U2 BURNER AIR REGISTER - 3	U2 BURNER AIR REGISTER - 4	U2 BURNER AIR REGISTER - 5	U2 BURNER AIR REGISTER - 6	U2 BURNER AIR REGISTER - 7	U2 BURNER AIR REGISTER - 8	U2 COAL FEEDER LOCAL CONTROL PANEL-A	U2 COAL FEEDER LOCAL CONTROL PANEL-B	SPACE	U2 F.D.FAN A OUTLET DAMPER
EQUIPMENT TAG	2BA513X	2BA514X	2BA515X	2BA516X	2BA517X	2BA518X	2BY510JA	2BY510JB	-	2BA500A



	2-812	2-811-1	2-810-1	0-503	2-1001	2-1001	2-1007	2-1001	2-526	2-523
SCHEMATIC E2-1200 SH.	2BA008	2BY035	2BA009	2WS004	2HC004	2HC005	2HC002	2HC001	2BD004	2S4001
KW, KVA OR MOTOR HP	1.5 KW	0.2 KW	0.75 KW	0.2 KW	1.9 KW	1.9 KW	8.25 KW	4.55 KW	0.2 KW	0.2 KW
STARTER NEMA SIZE	-	-	-	-	-	-	-	-	-	-
BREAKER/MCP RATING (AMPS)	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A
OL RATING (AMPS)	-	-	-	-	-	-	-	-	-	-
SERVICE	U2 G.A.H INLET DAMPER-A	U2 G.A.H OUTLET DAMPER (P.A)	U2 G.A.H OUTLET DAMPER (S.A)	U2 SERVICE WATER FOR GAH-A STOP VALVE	U2 HOIST BOX FOR GAH A	U2 HOIST BOX FOR GAH B	U2 HOIST BOX FOR ID FAN	U2 HOIST BOX FOR PULVERIZER	U2 HRH STEAM VENT STOP MOV	U2 INERTING STEAM STOP MOV FOR PULVERIZER-A
EQUIPMENT TAG	2BA530A	2BY503A	2BA503A	2WS505	2HC504G	2HC505G	2HC502G	2HC501G	2BD545	2S4501A



	2-523	2-811-1	2-809	2-818-A	2-818-C	2-526	2-708	2-519	2-519
SCHEMATIC E2-1200 SH.	-	2S4003	2BD003	2BY031	2BY033	2BD002	2NH003	2FW027	2FW026
KW, KVA OR MOTOR HP	-	0.2 KW	0.4 KW	25 KVA	25 KVA	0.2 KW	3.7 KW	0.4 KW	0.4 KW
STARTER NEMA SIZE	-	-	-	-	-	-	-	-	-
BREAKER/MCP RATING (AMPS)	-	16A	16A	50A	50A	16A	16A	16A	16A
OL RATING (AMPS)	-	-	-	-	-	-	-	-	-
SERVICE	SPACE	U2 INERTING STEAM STOP MOV FOR PULVERIZER-C	U2 P.A.FAN A OUTLET DAMPER	U2 PULVERIZER CLASSIFIER VFD PANEL - 1	U2 PULVERIZER CLASSIFIER VFD PANEL - 3	U2 SATURATED STEAM VENT STOP MOV	CATALYST LIFTING HOIST 2	U2 SPRAY WATER FOR AUX. STEAM C/V INLET STOP MOV	U2 SPRAY WATER FOR RH C/V INLET STOP MOV
EQUIPMENT TAG	-	2S4501C	2BD534	2BY521J	2BY523J	2BD531	2NH602S	2FW524	2FW517

NOTES

1. FOR SYMBOLS AND REFERENCE DRAWINGS REFER SHT.001 OF THIS DRAWING.

DRAWING RELEASE RECORD

REV.	DATE REL'D.	PREPARED	REVIEWED	APPROVED	PURPOSE
0	05SEP2015	N.NIKAM/V.PATEL	R.DESAI/K.PATEL	Y.MISHRA/K.NOMANBHOY	ISSUED FOR CONSTRUCTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

Contractors: SK E&C USA

Engineers: Sargent & Lundy

Client: Minera Panamá

PROJECT NO.: 12889-001

Project Title: PACO POWER PLANT

DRAWING TITLE

KEY DIAGRAM
U2 480V MCC 42A1
(2AP847E)

DRAWING NUMBER	REVISION
E2-1115	0

SHEET 002 OF 004

CAD FILE: E2-1115-002.DGN

ALL 2-801 Boiler
Except as noted

ALL 2-801 Boiler
Pressure Parts
Unless noted

2-801

PRIMARY SUPERHEATER

HRA FRONT WALL

HRA MIDDLE WALL

HRA ROOF REAR WALL

STEAM DRUM
2-801

LEFT

RIGHT

ECONOMIZER
2-801

SILENCER
1HP500F

2-526

2-809

2-820

2-519

50000-D001-2 (F-12)
TO 1ST PLATEN SUPERHEATER

NITROGEN GAS
(FOR PRESERVATION)

50000-D001-2 (C-3)
TO REHEATER & SUPERHEATER VENT

50000-D001-2 (H-2)
FROM MAIN STEAM PSV

FOR SAFETY VALVE TEST
50000-D001-2 (A-3)
TO COLD REHEAT STEAM

50000-D007 (C-4)
TO IBD TANK

M1-0129-1 (D-2)
TO SAMPLING RACK

50000-D001-2 (E-3)
TO PENDENT S/H SPRAY

M1-0125-3 (E-1)
CHEMICAL INJECTION

M1-0129-1 (D-2)
TO SAMPLING RACK

50000-D007 (F-12)
CONTINUOUS BLOW DOWN
TO CBD TANK

50000-D007 (F-8)
INTERMITTENT BLOW DOWN
TO IBD TANK

M1-0108-2 (E-6)
FROM B.F.W.P

50000-D007 (F-7)
TO IBD TANK

50000-D001-2 (E-12)
TO PRIMAY S/H SPRAY

50000-D001-2 (E-8)
TO PENDENT S/H SPRAY

** LOOSE ITEMS SHALL BE SUPPLIED BY HANSOL SEENTEC.
(CONTROL V/V & BY-PASS V/V ONLY)

NORMAL OPERATION

START-UP & MIN. LOAD

REFER TO "M1-0108"

NOTE

1. MARK: S> S> MEANS BOILER MAKER SCOPE OF SUPPLY.
2. EWLI SHALL BE PROVIDED WITH REMOTE DISPLAY UNIT TO BE PLACED ON OPERATOR DESK IN CCR
3. ASME CODE BREAK ASME SEC I BOILER
4. AFTER POPPING TEST, PIPE PIECE SHALL BE REMOVED AND THEN IT MUST BE FINISHED TO BLIND FLANGE.

FOR CONSTRUCTION

NO.	DATE	REVISION DESCRIPTION	DRAWN	CHK'D	APP'D
1	'14.09.29	FOR CONSTRUCTION	S.J.KIM	K.J.LEE	E.R.CHO
A	'14.06.11	FOR CONSTRUCTION	S.J.KIM	K.J.LEE	E.R.CHO
0	'14.03.26	FOR CONSTRUCTION	S.J.KIM	K.J.LEE	E.R.CHO
A	'13.11.05	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
1	'13.06.21	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
0	'13.02.08	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
A	'12.12.14	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
B	'12.08.31	FOR APPROVAL	K.H.HA	K.J.LEE	E.R.CHO
A	'12.04.30	FOR APPROVAL	K.H.HA	K.J.LEE	H.D.LEE

OWNER: Minera Panamá — Minera Panama S.A

CONTRACTOR: SK E&C — SK Engineering & Construction Co. Ltd.,

CONTRACTOR'S ENGINEER: SL — Sargent & Lundy

VENDOR: Hansol SeenTec — SeenTec Co., Ltd.

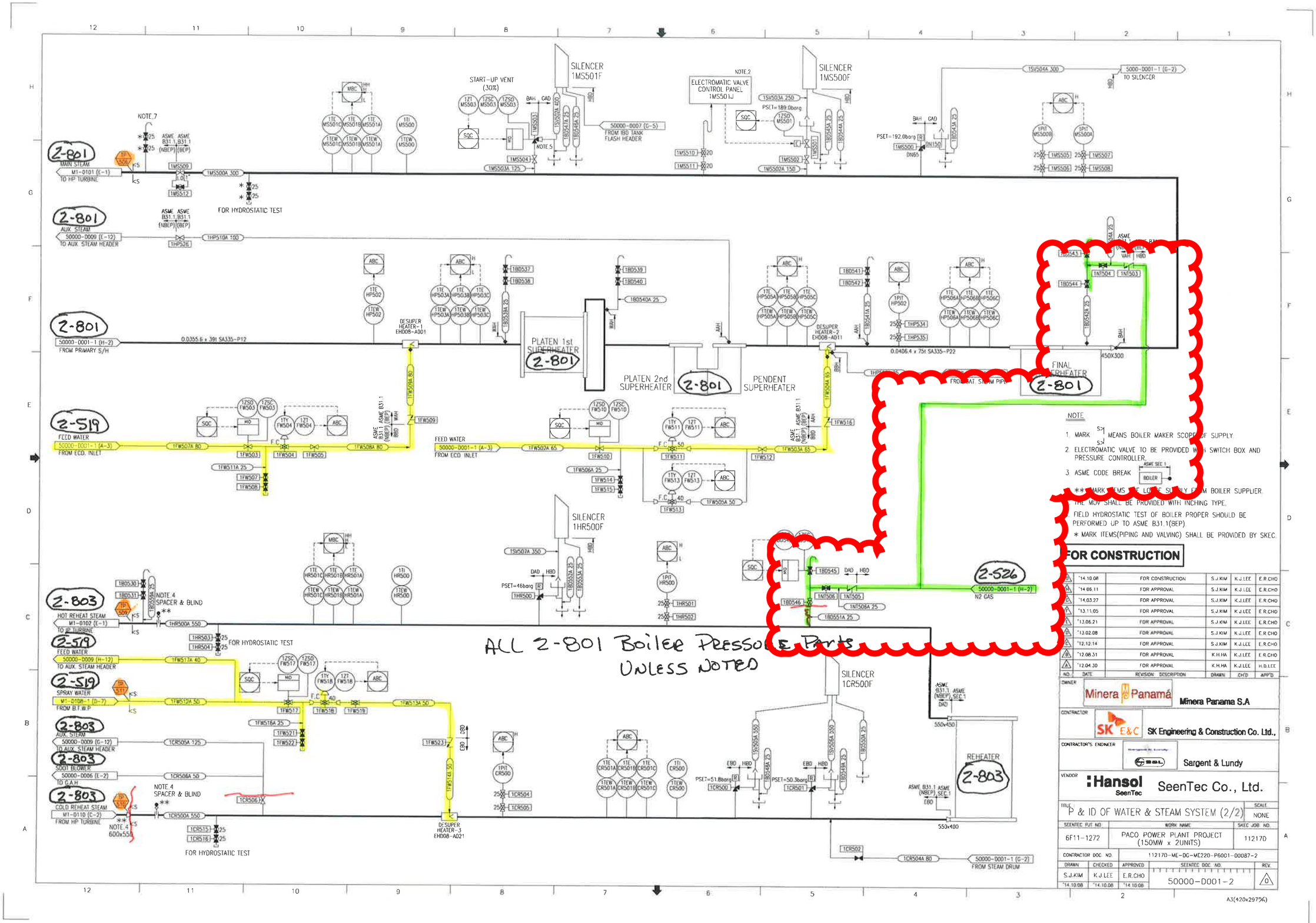
TITLE: P & ID OF WATER & STEAM SYSTEM (1/2) — SCALE: NONE

SEENTEC PJT. NO.	WORK NAME	SKEC JOB NO.
6F11-1272	PACO POWER PLANT PROJECT (150MW x 2UNITS)	11217D

CONTRACTOR DOC NO.: 11217D-ME-DC-ME220-P6001-00087-1

DRAWN	CHECKED	APPROVED	SEENTEC DOC NO.	REV.
S.J.KIM	K.J.LEE	E.R.CHO	50000-D001-1	2
'14.09.29	'14.09.29	'14.09.29		

A3(420x297%)



NOTE

1. MARK [S] MEANS BOILER MAKER SCOPE OF SUPPLY.
2. ELECTROMATIC VALVE TO BE PROVIDED WITH SWITCH BOX AND PRESSURE CONTROLLER.
3. ASME CODE BREAK
4. ** MARK ITEMS ARE LOOSE SUPPLY FROM BOILER SUPPLIER. THE MOV SHALL BE PROVIDED WITH INCHING TYPE.
5. FIELD HYDROSTATIC TEST OF BOILER PROPER SHOULD BE PERFORMED UP TO ASME B31.1(BEP).
6. * MARK ITEMS(PIPING AND VALVING) SHALL BE PROVIDED BY SKEC.

FOR CONSTRUCTION

NO.	DATE	REVISION DESCRIPTION	DRAWN	CH'D	APP'D
A	'14.10.08	FOR CONSTRUCTION	S.J.KIM	K.J.LEE	E.R.CHO
A	'14.06.11	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
A	'14.03.27	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
A	'13.11.05	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
A	'13.06.21	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
A	'13.02.08	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
A	'12.12.14	FOR APPROVAL	S.J.KIM	K.J.LEE	E.R.CHO
A	'12.08.31	FOR APPROVAL	K.H.HA	K.J.LEE	E.R.CHO
A	'12.04.30	FOR APPROVAL	K.H.HA	K.J.LEE	H.D.LEE

OWNER: Minera Panamá — Minera Panama S.A

CONTRACTOR: SK E&C — SK Engineering & Construction Co. Ltd.,

CONTRACTOR'S ENGINEER: S&L — Sargent & Lundy

VENDOR: Hansol SeenTec — SeenTec Co., Ltd.

TITLE: P & ID OF WATER & STEAM SYSTEM (2/2) — SCALE: NONE

SEENTEC PJT NO.	WORK NAME	SKEC JOB NO.
6F11-1272	PACO POWER PLANT PROJECT (150MW x 2UNITS)	11217D

CONTRACTOR DOC. NO.: 11217D-ME-DG-ME220-P6001-00087-2

DRAWN	CHECKED	APPROVED	SEENTEC DOC. NO.	REV.
S.J.KIM	K.J.LEE	E.R.CHO	50000-D001-2	0
'14.10.08	'14.10.08	'14.10.08		

A3(420x297%)

Minera Panamá

PACO
Motor List

SK E&C

Sargent & Lundy

Motor Tag	Client Tag	Description	Startup Code	Voltage Class
2BD531	2BD531	SATURATED STEAM VENT STOP MOV	2-526	LV
2BD545	2BD545	HRH STEAM VENT STOP MOV	2-526	LV